

FIRE AND WATER.

BY SOPHIE B. HERRICK.

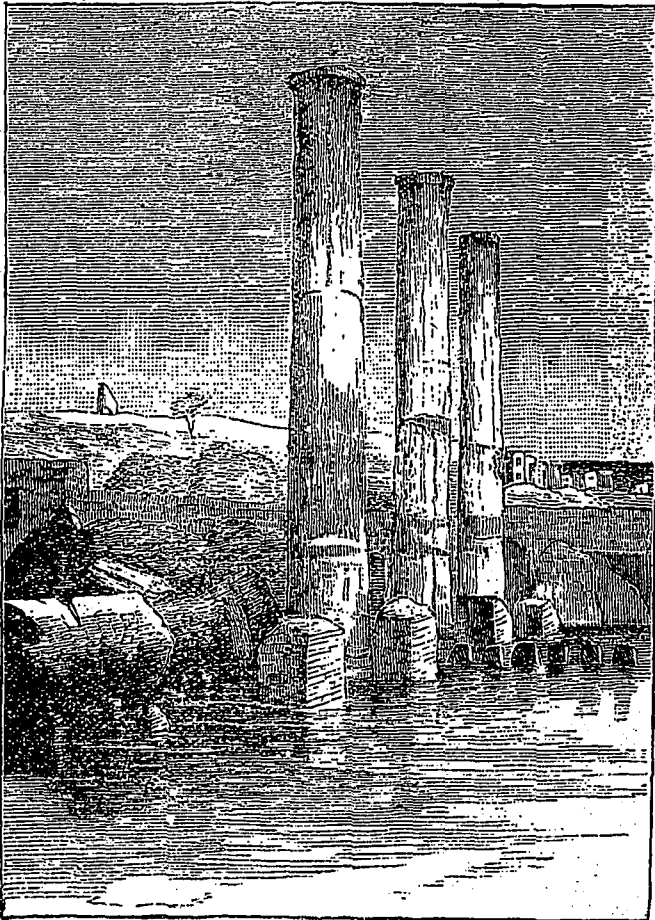


Fig. 2.—TEMPLE OF SERAPIS.

The sea along the western coast of Scotland is filled with numberless islands, which look on the map as if they might have been broken from the solid land. One of these is a tiny island lying close in the embrace of a larger one. Though it shows as a mere speck on the map, this little island of Staffa is known the world over for its wonderful natural formations. On the edge of the sea, rising direct from the water, is the well-known Fingal's Cave. The regularity of its formation is so remarkable that it is hard to believe it to be a work of nature. Lofty columns of regular shape stand up out of the sea, built up, it would seem, of block upon block of solid stone carefully chiselled and as carefully laid upon each other.

On the northern coast of Ireland at the point which is nearest the Scottish coast, is another wonderful assemblage of these columns, roofless, and running out into the sea, called the Giant's Causeway.

An old story makes these two wonders the ruins of castles built and inhabited by two unfriendly giants. The cave has received the name of the Scotch giant Fingal. There are many old poems, sung among the Highlanders in the far past, of which Fingal is the hero, but we now know that no man's or giant's hand helped to lift these great blocks of stone one upon the other. They were built up by the fires under the earth. The melted stone poured out of the volcanoes above and spread over the land and there as it hardened and cooled, split up into great crystals or columns. The water dashing for thousands of years



Fig. 1.—FINGAL'S CAVE.

against them washed away the earth around and the broken fragments, but was dashed back again by a few of the hard unbroken columns, and so were left Fingal's Cave, the Giant's Causeway, and other formations like these.

Too long ago for you even to imagine it, there was a great bridge of these columns

India, seventy years ago, one of these sudden changes took place which was very remarkable. There was an earthquake shock, and a great piece of land fifty miles long and sixteen broad was suddenly lifted up ten feet higher than the country around, and there it has stayed, with a straight wall around the edge called by the natives "Ullah Bund," or "God's Wall," from the mysterious way in which it arose.

Without any earthquake shock or sudden movement continents are in some places slowly sinking and in others as slowly rising. It might seem as if it were the waters which were rising or falling, but a moment's thinking will show you that this cannot be so. Water soon comes to a level, and as there is nearly the same quantity in the oceans all the while, it must be the land that is changing.

There was a great many years ago, before Christ came into the world, a temple built on the Gulf of Baia, near Naples. Three pillars are still standing of this temple, though they have seen many ups and downs since their building. The original pavement was of beautiful mosaic, and so well built that it still remains, though the earth on which it stands slowly sank for many years. About two hundred years after Christ a new floor was laid six feet above the old one, showing at that time how much the earth had sunk. Down, down the pillars went into the sea, till they had sunk twenty-six feet. Then came a terrible eruption of volcanic lava, and the temple was lifted bodily more than twenty feet, the pillars still standing upright. Twenty-six feet above the first pavement, and for twelve feet below that line, the pillars have been fairly pitted by some small sea animal which had burrowed into the marble when it was under the sea. The story of the temple's travels is written on the face of the pillars. Now the temple is again slowly sinking at the rate of an inch a year.

Our own continent is tilting up in some places and sinking down in others. The Florida coast is sinking, the North Carolina coast is rising. Near Boston the land is rising, and Greenland for six hundred miles is sinking so manifestly that the Greenlanders have learned not to build their huts close by the sea. An island in the Gulf of St. Lawrence is gradually tipping; its southern coast is dipping down and its northern rising into high bluffs. The water and the fire in doing these

reaching from Scotland to Ireland; the Giant's Causeway was one abutment, and Fingal's Cave another. In the thousands of years that have passed since, the rest of the bridge has been swept away and destroyed, with only here and there an island of columns between to tell the tale.

These rocks—hardened volcanic rock—are called basalt. They are not the only things which in drying contract and split into crystals. Take some common starch, dissolve it in water, and let it gradually dry; you will find that it is not a plain flat sheet, but that it, too, has split up into crystals. Nothing, however, splits up as regularly as basalt does.

The great central fires of the earth are constantly at work, sometimes acting with shocks, and sometimes quietly and steadily changing the face of the earth. In

mighty works, in gradually turning and tilting continents and islands, and wearing them down again, do not forget some smaller duties in the way of carving and ornamenting and beautifying the earth.

The hot water, filled with carbonic acid, which comes from the fires beneath the earth has the power to dissolve certain minerals; these it brings up to the surface of the earth. The carbonic acid goes off in gas when it comes to the air, but the lime and other minerals are allowed to settle; there they harden and form a cup, from which the water drips down, forming limestone icicles or stalactites. Finally cup after cup is formed in this way (Fig. 3), most wonderfully ornamented. In one place in Italy such a spring, which is at the top of a hill, has encased the whole hill in a layer of stone formed from its settlings.

In carbonated springs like those in Fig. 3 most of the lime settles at the bottom, as earth will in water; but there is a still more wonderful kind of spring which builds its own basin, and after a while makes itself into a fountain. Such a spring is called a geyser. These are very rare, because it takes so many different things acting together to form them. They are the children of fire and water. Geysers are found in Iceland, New Zealand, and in the Western States (Fig. 4). Those in the Yellowstone National Park, in Wyoming Territory, are perhaps the largest and most curious in the world. Indeed, that region abounds with wonderful examples of Nature's handiwork, which must be interesting to students of geology.

A geyser begins by being a little hot spring; it ends by being a natural fountain. Geyser water has been put into a basin, and allowed slowly to dry up. It is then found that the settlings from this water are not on the bottom, but that, as the water dried, it left a solid rim around the basin, and as it sank, the rim broadened downward.

In the geyser water there is a white and glassy substance that, as it settles, builds a cup for itself; when the water overflows the cup, it naturally runs out of the lowest place. Here the solid rim is built up by the glassy silica till that gets higher; the water then shifts and flows over the lowest place left, building slowly the lowest places in the rim, till, instead of a cup, it makes a high tube with a mound of silica all round it.

Sometimes the water will lie quiet in the tube for a good while; but the fires beneath are turning water into steam, and when enough steam forms, it lifts the water in the tube, in its struggles to get out, until finally the water is thrown up into the air violently, like the jet of a mighty fountain. The steam escapes in a single burst or in several; the water sinks back and lies quiet for a while, till steam is again formed, and the fountain jets again.

A toy geyser can be made of an upright tube of iron filled with water, and two gas jets burning against the tube, one above another. Every different way that a geyser plays can be imitated on this simple little arrangement. It would take too long to explain why some geysers are too young to play and why some are too old; why some play at fixed times, and others only when a clod of earth or something of the kind is thrown into the tube; but if you could see the experiment tried on the toy geyser, it would not be hard to understand.—*Harper's Young People*

REVENGE.

An English traveller in the East gives the camel a very poor character. According to his account the creature is

from first to last undomesticated and savage, rendered serviceable not by tameness but by stupidity.

One passion alone he possesses, namely, revenge, in the carrying out of which he shows an unexpected degree of far-thoughted malice, united with all the cold stupidity of his usual character.

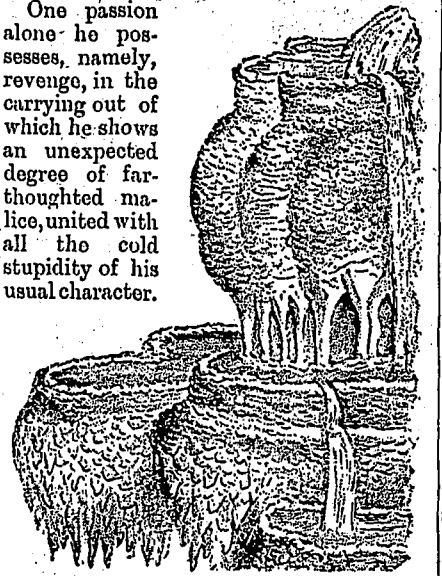


Fig. 3.—CARBONATED SPRINGS.

One instance of this I well remember.

A lad of about fourteen had conducted a large camel, laden with wood, to another village at about half an hour's distance. As the animal loitered or turned out of the way, its driver struck it repeatedly, and harder than it seems to have thought he had a right to do. But not finding the occasion favorable for taking immediate quits, it bided its time; nor was that time long in coming.

A few days later the same lad had to reconduct the beast, unladen, to his own village. When they were about half way on the road, and at some distance from any habitation, the camel suddenly stopped, looked deliberately round in every direction to assure itself that no one was within sight, and finding the road clear of passengers, made a step forward, seized the unlucky boy's head in its monstrous mouth, and lifting him into the air flung him down again with the upper part of his skull completely torn off.

Having thus satisfied its revenge, the brute quietly resumed its pace towards the village, as though nothing were the matter, till some men who had observed the whole proceeding, though unfortunately at too great a distance to be able to afford timely assistance, came up and killed it.—*Youth's Companion*.

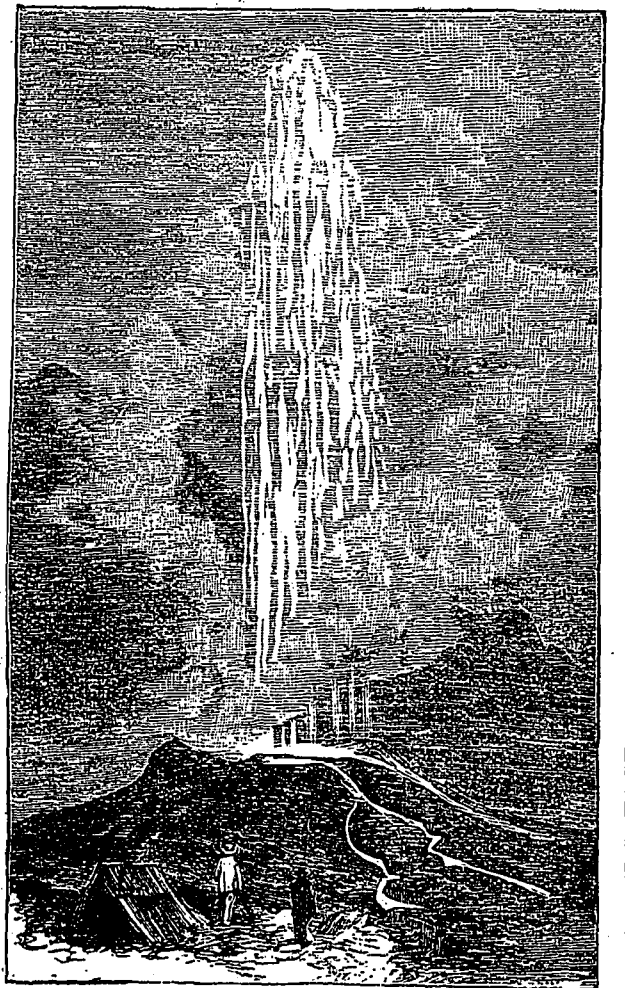


Fig. 4.—A GEYSER.